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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,116	07/28/2003	Peter Mardilovich	200309593-1	5931
22879	7590	12/15/2006	EXAMINER	
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			LEE, CYNTHIA K	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,116

Applicant(s)

MARDILOVICH ET AL.

Examiner

Cynthia Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 49-84 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 49-84 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Response to Amendment

This Office Action is responsive to the amendment filed on 10/16/2006. Claims 68-84 have been added. Claims 49-84 are pending. Claims 49, 51, 55, 57, 58 have been amended. Applicant's arguments have been fully considered and are persuasive. However, upon further consideration, the instant claims are rejected under new grounds of rejections and thus, claims 49-84 are finally rejected for reasons of record and for reasons necessitated by applicant's amendment.

Specification

The disclosure is objected to because of the following informalities:

It is unclear what the applicants mean by a single chamber and dual chamber throughout the entire specification, especially since the specification [0026] states that the two chambers is not shown in Fig. 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 55 and 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "substantially" in claim 57 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and

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one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 58, 59, 65, 66, 68, 69, 76, 77, 78 are rejected under 35 U.S.C. 102(b) as being anticipated by Agruss (US 3503808).

Agruss discloses a fuel cell comprising a support substrate supporting a cathode, anode, and electrolyte and a plurality of pores formed through said substrate, said pores having a size and shape formed in accordance with a pre-selected desired porosity. The anode and cathode comprise potassium and thallium and are solid anode and cathode material (claim 58).

The fuel cell is disposed in one chamber (applicant's claim 76).

The electrolyte is deposited in the pores (2:20-40). Agruss discloses that the support substrate is made of porous Alundum (2:35). Alundum is defined as

Alundum

noun Trademark

A hard material composed of fused alumina, used as an abrasive and a refractory.

Collins English Dictionary, © HarperCollins Publishers 2000 ⓘ

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Alundum. (2000). In *Collins English Dictionary*. Retrieved November 24, 2006, from <http://www.xreferplus.com/entry/2616224>

Regarding claim 77, since the electrolyte is in direct contact with the pores, the electrolyte is necessarily deposited on the sides of interiors of the pores. Regarding claim 78, Agruss' porous substrate will mix with the electrolyte because the electrolyte is in solution form. Particularly, the molten metal fuel cell operates at high temperatures (3;1-5), and thus, diffusion of the electrolyte solution into the fused alumina particles will be enhanced.

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Claims 49, 58, 72, 74, 75, 81, 83, and 84 are rejected under 35 U.S.C. 102(b) as being anticipated by Sarkar (US 2005/0196657).

Sarkar discloses a solid oxide fuel cell comprising an outer ceramic support matrix [0078, 0079]. The matrix is a porous material to allow for the flow of oxidant. The matrix is a solid foam made by sintering a foam slurry, or a wool made of ceramic, or a fibrous bundle comprised of a plurality of entangled fibres visually resembling "cotton candy" [0082]. This configuration necessarily has pore diameters varying in the thickness direction.

Sarkar discloses that the electrolyte is a yttria-stabilized zirconia. The anode is a nickel/zirconia cermet. The cathode is a lanthanum manganate. [0003]

Claim Rejections - 35 USC § 103

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 49-57, 68, 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agruss (US 3503808) in view of Pekala (US 2002/0142214).

Agruss discloses a fuel cell comprising a support substrate supporting a cathode, anode, and electrolyte and a plurality of pores formed through said substrate.

The electrolyte is deposited in the pores (2:20-40). Agruss discloses that the support substrate is made of porous Alundum (2:35). Alundum is defined as

Alundum

noun Trademark

A hard material composed of fused alumina, used as an abrasive and a refractory.

Collins English Dictionary, © HarperCollins Publishers 2000 ⓘ

APA | MLA | Chicago : [Citing this entry](#)

Alundum. (2000). In *Collins English Dictionary*. Retrieved November 24, 2006, from <http://www.xreferplus.com/entry/2616224>

Regarding claims 68, since the electrolyte is in direct contact with the pores, the electrolyte is necessarily deposited on the sides of interiors of the pores. Regarding claim 69, Agruss' porous substrate will mix with the electrolyte because the electrolyte is in solution form. Particularly, the molten metal fuel cell operates at high temperatures

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(3;1-5), and thus, diffusion of the electrolyte solution into the fused alumina particles will be enhanced.

Agruss does not disclose the specifics of the pores (claims 49, 51-55 and 57). However, Pekala discloses a porous substrate with through pores containing electrolyte. The porous substrate supports gel electrolyte on both sides and liquid electrolyte is filled in the pores. [0047].

Pekala discloses a porous substrate with pores that vary in diameter along a thickness of the substrate (applicant's claim 51). The pores also branch within the substrate (applicant's claim 52). The branching results in a greater number of pore openings on one side than on another side (applicant's claim 53). The Office notes that since branching occurs randomly on both sides of the substrate, various portions of the substrate will meet claim 54 in which the anode is disposed on the side with greater pores. Further, since pores that contain multiple branching will be necessarily be larger than pores without branching or pores with a single branch, the average pore size containing multiple branching are larger than the average pore size of a single branching or no branching (applicant's claim 57). See Fig 5a. The pores in the substrate varies in diameter through a thickness of said substrate (claim 49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Agruss' electrolyte substrate with Pekala's porous substrate for the benefit of more evenly distributing the Agruss' electrolyte in the fuel cell.

Regarding claim 55 and 57, Fig 2 and 3 depicts images of the porous substrate. Absent a definition of what the Applicant means by "substantially," the pores shown in Fig 2 and 3 meet the limitation "substantially uniform in size and shape."

It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Agruss and Pekala address the technology of distributing the electrolyte solution through a porous material.

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Claims 60-64, 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Agruss (US 3503808) as applied to claim 58 in view of Pekala (US 2002/0142214).

Agruss discloses all the elements of claim 58 and are incorporated herein. Agruss does not disclose the specifics of the pores. However, Pekala discloses a porous substrate with through pores containing electrolyte. The porous substrate supports gel electrolyte on both sides and liquid electrolyte is filled in the pores. [0047].

Pekala discloses a porous substrate with pores that vary in diameter along a thickness of the substrate (applicant's claim 60). The pores also branch within the substrate (applicant's claim 61). The branching results in a greater number of pore openings on one side than on another side (applicant's claim 62). The Office notes that since branching occurs randomly on both sides of the substrate, various portions of the

substrate will meet claim 63 in which the anode is disposed on the side with greater pores. Further, since pores that contain multiple branching will be necessarily be larger than pores without branching or pores with a single branch, the average pore size containing multiple branching are larger than the average pore size of a single branching or no branching (applicant's claim 67). The pores are parallel through the substrate (applicant's claim 64). See Fig 5a.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Agruss' electrolyte substrate with Pekala's porous substrate for the benefit of more evenly distributing the Agruss' electrolyte in the fuel cell.

It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both Agruss and Pekala address the technology of distributing the electrolyte solution through a porous material.

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Claims 70, 71, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkar (US 2005/0196657) as applied to claim 49, in view of Doshi (US 6558831).

Sarkar does not disclose that the anode is a nickel yttria-stabilized zirconia and that the cathode is lanthanum manganite. However, Doshi teaches that the anode is a nickel/YSZ and the cathode is lanthanum manganite. It would have been obvious to

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one of ordinary skill in the art at the time the invention was made to substitute Sarkar's anode and cathode material for Doshi's nickel/YSZ and lanthanum manganite because It has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Se MPEP 2144.07.

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Claims 79, 80, 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkar (US 2005/0196657) as applied to claim 58 and claim 81, in view of Doshi (US 6558831).

Sarkar does not disclose that the anode is a nickel yttria-stabilized zirconia and that the cathode is lanthanum manganite. However, Doshi teaches that the anode is a nickel/YSZ and the cathode is lanthanum manganite. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Sarkar's anode and cathode material for Doshi's nickel/YSZ and lanthanum manganite because It has been held by the court that the selection of a known material based on its suitability for its intended use is *prima facie* obvious. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Se MPEP 2144.07.

Response to Arguments

Applicant's prior art arguments filed 10/16/2006 have been considered but are moot in view of the new ground(s) of rejection.

Applicant asserts that the terms "single chamber" and "dual chamber" are commonly known in the art.

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The Examiner is not aware of the terms "single chamber" and "dual chamber" used in the fuel cell art. Applicant is advised to support this assertion with concrete evidence.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ckl

Cynthia Lee

Patent Examiner


SUSY TSANG-FOSTER
PRIMARY EXAMINER